EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Anthony T. Moosey (Reg. No. 55,773) on 8/25/2009.

Examiner Amendments

The application has been amended as follows:

2. Claims 1, 8, 10, 17, and 22 are Currently Amended, as presented below. Claims 2-7, 9, 11-16, 18-21, and 23-30 are Previously Presented, as entered by Applicant's amendments after final submitted on 7/6/2009 and 8/24/2209.

1. (Currently Amended) A network interface controller, comprising:

a hashing logic to generate a hashing value from a packet received from a network including an index to a table content derived from a transformation of information in a header of the packet,

wherein the received packet ~~having~~ has a context associated therewith;

a memory to store:

a hash table pages table to store a physical page address of a host hash table stored in a host memory of a host; and

a context table pages table to store a physical page address of a host context table in the host memory; and

a cache line determinator in communication with the host and the hashing logic, the cache line determinator being configured to:

determine a hash node page and a context table page corresponding to the hashing value;

lookup the physical address of the hash table page from the hash table pages table;

lookup the physical address of the context table page from the hash the context table pages table;

determine the host hash cache line using the physical address of the hash table page and an offset of the hash value within the hash table page;

determine the host context cache line using the physical address of the context table page and an offset of the hash value within the context table page;

associate the ~~hash~~ hashing value with [[a]] the host hash table cache line using the hash table pages table; and

associate the ~~hash~~ hashing value with [[a]] the host context table cache line in the host memory using and the context table pages table.

8. (Currently Amended) A network interface controller, comprising:

a hardware card comprising:

a hashing logic to generate a hashing value from a packet received from a network including an index to a table content derived from a transformation of information in a header of the packet, wherein the received packet ~~having~~ has a context associated therewith;

a cache line determinator in communication with the hashing logic, the cache line determinator being configured to:

determine a hash node page and a context table page corresponding to the hashing value,

lookup the physical address of the hash table page from the hash table pages table,

lookup the physical address of the context table page from the hash the context table pages table,

determine the host hash cache line using the physical address of the hash table page and an offset of the hash value within the hash table page,

determine the virtual host hash table cache line using the physical address of the context table page and an offset of the hash value within the context table page,

associate the hashing value with the host hash table cache line using the hash table pages table; and

associate the hash value with [[a]] the virtual host hash table cache line and the [[a]] virtual host context table cache line in a memory of the host of the [[a]] network interface controller;

wherein the network interface controller is configured to issue a pre-fetch of the host context table cache line and the host hash table cache line to the host.

10. (Currently Amended) A method for processing incoming packets from a network, comprising:

hashing, by a network interface controller in communication with a host and a network, a packet received from the network,

wherein the packet ~~having~~ has a context associated therewith to generate a hash value from context of the received packet including an index to a table content derived from a transformation of information in a header of the packet;

computing a host hash table cache line in a host memory of the host using the hash value and using a hash table pages table stored in a memory of the network interface controller and storing memory physical page addresses of a host hash table stored in the host memory of the host; [[and]]

computing a host context table cache line in the host memory using the hash value and using a context table pages table stored in a memory of the network interface

controller and storing memory physical page addresses of a host context table stored in the host memory of the host; and

issuing a pre-fetch of the host context table cache line and the host hash table cache line;

wherein computing the host hash table cache line includes:

determining a hash node page and a context table page corresponding to the hash value;

looking up the physical address of the hash table page and the context table page from the hash table pages table and the context table pages table, respectively; and

determining the host hash cache line and the host context cache line using the physical address of the hash table page and the context table page and an offset of the hash value within the hash table page and the context table page, respectively.

17. (Currently Amended) A computer program product stored on a computer readable medium to process packets, the program including instructions for causing at least one processor to:

hash, by a network interface controller in communication with a host and the _a network, a packet received from the network, the packet having a context associated therewith to generate a hash value from context of the received

packet including an index to a table content derived from a transformation of information in a header of the packet;

compute a host hash table cache line in a host memory of the host using the hash value and using a hash table pages table stored in a memory of the network interface controller and storing physical page addresses of a host hash table stored in the host memory; [[and]]

compute a host context table cache line in the host memory using the hash value and using a context table pages table stored in the memory of the network interface controller and storing physical page addresses of a host context table stored in the host memory; and

issuing a pre-fetch of the host context table cache line and the host hash table cache line;

wherein the instructions to compute the host hash table cache line further include instructions for causing the at least one processor to:

determine a hash node page and a context table page corresponding to the hash value;

lookup the physical address of the hash table page and the context table page from the hash table pages table and the context table pages table, respectively; and

determine the host hash cache line and the host context cache line using the physical address of the hash table page and the context table page and

an offset of the hash value within the hash table page and the context table page, respectively.

22. (Currently Amended) A system, comprising:

a host CPU;

a host memory;

a network interface controller (NIC); and

a host bus to facilitate the host CPU, host memory, and the NIC to communicate therebetween,

wherein the NIC comprises:

a hashing logic to generate a hashing value from a packet received over a network including an index to a table content derived from a transformation of information in a header of the packet, the received packet having a context associated therewith;

a hash table pages table to store a physical page address of a host hash table stored in the host memory of the host CPU; and

a context table pages table to store a physical page address of a host context table stored in the host memory of the host CPU; and

a cache line determinator in communication with the host bus and the hashing logic, and

wherein the cache line determinator is being configured to:

determine a hash node page and a context table page corresponding to the hashing value;

lookup the physical address of the hash table page from the hash table pages table;

lookup the physical address of the context table page from the hash the context table pages table;

determine the host hash cache line using the physical address of the hash table page and an offset of the hash value within the hash table page;

determine the host context cache line using the physical address of the context table page and an offset of the hash value within the context table page;

associate the ~~hash~~ hashing value with [[a]] the host hash table cache line using the hash table pages table; and

associate the ~~hash~~ hashing value with [[a]] the host context table cache line in the host memory using and the context table pages table.

Reasons for Allowance

3. The following is an examiner's statement of reasons for allowance:

The closest prior art of record, US 7,174,393 to Boucher, does not disclose certain features of claim 1. For example, Boucher does not disclose the specific functionality of the cache line determinator, such as determining a hash node page and

a context table page corresponding to the hashing value, lookup the physical address of the hash table page from the hash table pages table, lookup the physical address of the context table page from the hash of the context table pages table, determine the cache line using the physical address of the hash table page and an offset of the hash value within the hash table page, or determining the host context cache line using the physical address of the context table page and an offset of the hash value within the context table page. Further, the specific relationships between the cache line determinator, the hash table pages, and the context table pages is not specifically disclosed by Boucher.

No other prior art of record fairly teaches or suggests modifying Boucher to perform the functionality of the cache line determinator in as much detail as required by claim 1, or to have the specific relationships between the cache line determinator, the hash table pages, and the context table pages, further as detailed by claim 1. Further, claims 8, 10, 17, and 22 include similar subject matter to that of claim 1, and are considered allowable for similar reasons. Claims 2-7, 9, 11-16, 18-21, and 23-30, which depend from claims 1, 8, 10, 17, or 22, respectively, are considered allowable for similar reasons.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Christensen whose telephone number is (571)270-1144. The examiner can normally be reached on Monday through Thursday 6:30AM - 4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Vaughn can be reached on (571) 272-3922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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